CLAIMS

What is Claimed Is:

1. An electromagnetic pulse generator comprising:

a control unit;

at least two current sources;

at least two switching elements connected to the current sources, each of the switching elements structured to receive a signal from the control unit;

a switch connected to the at least two switching elements, the switch structured to receive a signal from the control unit; and

a load connected to the switch.

2. The electromagnetic pulse generator of claim 1, further comprising:

a first set of resistive elements connected to the current sources, and to the switching elements, the resistive elements also connected to a second voltage level.

3. The electromagnetic pulse generator of claim 1, further comprising:

a second set of resistive elements connected to the switching elements, and to the switch, the second set of resistive elements also connected to the second voltage level.

4. The electromagnetic pulse generator of claim 1, wherein the control unit comprises a finite state machine.

5. The electromagnetic pulse generator of claim 1, wherein the control unit comprises a microprocessor.

6. The electromagnetic pulse generator of claim 1, wherein the current sources are comprised of at least one transistor.

7. The electromagnetic pulse generator of claim 1, wherein the current sources are selected from a group consisting of: a Wilson current mirror and a Widlar current mirror.

8. The electromagnetic pulse generator of claim 1, wherein the current sources provide substantially the same current as a second current source.

9. The electromagnetic pulse generator of claim 1, wherein the current sources provide a substantially different current than a second current source.

10. The electromagnetic pulse generator of claim 1, wherein the switch elements comprise at least one transistor.

11. The electromagnetic pulse generator of claim 1, wherein the switch comprises at least one transistor.

12. The electromagnetic pulse generator of claim 1, wherein the switch comprises an inverter.

13. The electromagnetic pulse generator of claim 1, wherein the load is selected from a group consisting of: a resistive element, an energy storage element, and a capacitor.

14. The electromagnetic pulse generator of claim 1, wherein the electromagnetic pulses may vary in amplitude from about –5 volts to about 5 volts.

15. The electromagnetic pulse generator of claim 1, wherein the electromagnetic pulses may have a duration from about 1 pico-second to about 1 milli-second.

16. The electromagnetic pulse generator of claim 1, wherein the plurality of electromagnetic pulses represent data.

17. The electromagnetic pulse generator of claim 1, wherein the plurality of electromagnetic pulses are employed in an ultra-wideband communication system.

18. The electromagnetic pulse generator of claim 1, wherein a plurality of electromagnetic pulses produced by the electromagnetic pulse generator are aggregated to form a sinusoidal waveform.

19. The electromagnetic pulse generator of claim 18, wherein the sinusoidal waveform is employed to transmit data.

20. An electromagnetic pulse generator comprising:

a control unit;

a first set of current sources connected to a first voltage;

a first set of switching elements connected to the first set of current sources, each of the first set of switching elements structured to receive a signal from the control unit;

a switch connected to the first set of switching elements, the switch structured to receive a signal from the control unit;

a second set of switching elements connected to the switch, each of the second set of switching elements structured to receive a signal from the control unit;

a second set of current sources connected to the second set of switching elements, each of the second set of current sources connected to a second voltage level; and

a load connected to the switch, and to the second voltage level.

21. The electromagnetic pulse generator of claim 20, wherein the control unit is selected from a group consisting of: a finite state machine and a microprocessor.

22. The electromagnetic pulse generator of claim 20, wherein the first set and second set of current sources comprise at least one transistor.

23. The electromagnetic pulse generator of claim 20, wherein the first set and second set of current sources are selected from a group consisting of: a Wilson current mirror, and a Widlar current mirror.

24. The electromagnetic pulse generator of claim 20, wherein the first set and second set of current sources all provide substantially the same current.

25. The electromagnetic pulse generator of claim 20, wherein each of the first set and second set of current sources provide a different current relative to each other.

26. The electromagnetic pulse generator of claim 20, wherein each of the first set and second set of switching elements comprise at least one transistor.

27. The electromagnetic pulse generator of claim 20, wherein the switch comprises an inverter.

28. The electromagnetic pulse generator of claim 20, wherein each of the second set of current sources is selected from a group consisting of: a Wilson current mirror, and a Widlar current mirror.

29. The electromagnetic pulse generator of claim 20, wherein the load is selected from a group consisting of: a resistive element, an energy storage element, and a capacitor.

30. The electromagnetic pulse generator of claim 20, wherein the electromagnetic pulses may vary in amplitude from about –5 volts to about 5 volts.

31. The electromagnetic pulse generator of claim 20, wherein the electromagnetic pulses may have a duration from about 1 pico-second to about 1 milli-second.

32. The electromagnetic pulse generator of claim 20, wherein the plurality of electromagnetic pulses represent data.

33. The electromagnetic pulse generator of claim 20, wherein the plurality of electromagnetic pulses are employed in an ultra-wideband communication system.

34. The electromagnetic pulse generator of claim 20, wherein a plurality of electromagnetic pulses produced by the electromagnetic pulse generator are aggregated to form a sinusoidal waveform.

35. The electromagnetic pulse generator of claim 34, wherein the sinusoidal waveform is employed to transmit data.

36. An electromagnetic pulse generating system comprising:

control means for generating a plurality of digital signals;

electromagnetic pulse generating means for generating a plurality of electromagnetic pulses in response to the plurality of digital signals; and

aggregating means for combining the plurality of electromagnetic pulses.

37. The electromagnetic pulse generating system of claim 36, wherein the aggregating means combines the plurality of electromagnetic pulses into a desired sinusoidal waveform or into a group of electromagnetic pulses.

38. The electromagnetic pulse generating system of claim 36, wherein the control means are selected from a group consisting of: a digital computer microprocessor controlled by computer logic, and a finite state machine.

39. The electromagnetic pulse generating system of claim 36, wherein the electromagnetic pulse generating means are connected in parallel.

40. The electromagnetic pulse generating system of claim 36, wherein the electromagnetic pulse generating means are connected in series.

41. The electromagnetic pulse generating system of claim 36, wherein the aggregating means is selected from a group consisting of: a summing circuit, and a multiplier.

42. A method of transmitting data, the method comprising the steps of:

receiving data for transmission;

modulating the data;

providing an electromagnetic pulse generating circuit;

generating a plurality of electromagnetic pulses arranged to represent the modulated data; and

transmitting the plurality of electromagnetic pulses.

43. The method of transmitting data of claim 43, wherein the step of generating a plurality of electromagnetic pulses comprises means for generating a plurality of electromagnetic pulses.